FOCUS ON RAILWAY POWER CONVERTERS

designing and producing a wide range of railway power converters since 1986
RAILWAY POWER CONVERTERS SOLUTIONS

Onboard

1. Battery Charger 3.5kW with built-in Battery Pack
2. Battery Charger Catenary Supplied 3kW
3. ERTMS STM 150W DC/DC Converter
4. Auxiliary Power Unit integrated into HVAC system

Substation

5. Rectifier + Battery Charger
6. Power Insulation Transformer
7. 48 Vdc Power Station

Trackside Signalling

8. ERTMS Encoder AC/DC PSU
9. Battery torp. maintainable PSU for high speed line
10. SCMT Encoder AC/DC PSU
Battery Charger 3,5kW with built-in Battery Pack (BALIN)

For railway passengers cars

- VIN: 400 VAC 50 Hz, 3ph+n / 600 VDC
- VOUT: 24 VDC
- Full digital control
- RS485 interface for diagnostic
- Optional CAN interface for diagnostic
- IP67 electronic module

RGM developed BALIN according to Trenitalia needs to renovate its fleet of old batteries and battery chargers installed on passengers cars.
BALIN – Real view

Easy & Fast power connection of BALIN to the coach thanks to rear power contact for extractable box system

BALIN 4,5kW (peak) removable electronic module
Overall dimensions 565 x 240 x h 433 mm
Weight: approx. 25Kg
3kW – 250A Battery Charger Catenary Supplied

for trolleybus services’ battery

- VIN: 750 VDC nominal as per EN 50124-2,
- VOUT: 13.7 VDC nominal @ 250 A
- Three-level power circuit configuration
- Highly integrated and sophisticated digital control
- High frequency modulation
- CAN bus / Serial port interfaces available

The trolleybus catenary supplied battery charger is the first RGM device based over the three-level power circuit configuration. A highly integrated and sophisticated digital control, together with this state-of-the-art design, allows to use very high carrier modulation frequencies respect to the common devices in the same voltage/power class; this means lighter magnetic parts, better output form factors and highest efficiency.
150W DC/DC converter
for ERTMS Balise Transmission Module

- VIN: 24 VDC
- VOUT: +5 / ±15 / +24 VDC
- 150 W at +85°C operating temperature
- Meets EN 50155

The BTM controls the supply of energy for telepowering the balises. It receives and decodes the telegrams coming from the balises.
Auxiliary Inverter integrated inside HVAC system

For passengers’ cars emergency ventilation

- VIN: 110 VDC (battery)
- VOUT: 400 VAC, 50Hz, 3ph
- Max. output power for motor inrush: 400 W
- Operating Temperature range: -25 °C / +70 °C

The unit is designed to provide a 3 phase supply to an emergency fan with a reference signal to the inverter embedded in the fan assembly. The fan supplied with the device is intended to operate in case of failure of main power to the conditioner unit of the train.
700 W DC/DC Converter

for antennas on High speed trains

- VIN: 110 VDC
- VOUT: 24 VDC
- Power: 700 W
- Operating temperature: 0°C / +70°C
- Meets: EN 50155 / EN 61373 Shock and vibrations
4 kW Motor Drive

For passenger’s cars ventilation

- VIN: 400 Vca ± 5%, 50 ÷ 60 Hz THD < 25%
- VOUT: 400 VAC Balanced 3-ph sinusoidal
- Power: 4 KW
- Operating temperature: -25°C / + 70°C
- 4 different output speed configurations
110 VDC 5/10 kW Rectifiers + Battery Chargers
for M4 «blue line» Milano ESSs, Cabins

- VIN: 400VAC 50Hz, 3ph.
- VOUT: 110VDC 15/30/50A
- Full digital control
- Scalable, redundant, configurable
- Linux-based master control unit
- Wide range of communication interfaces
110 VDC 5/10 kW Rectifier + Battery Charger

- Dual rectifier with associated breakers
- Dual output converters
- Auxiliary power supplies
- MMI
  - LCD Display 4x20 characters
  - Keyboard
  - Synoptic panel
  - Web server

Communication Interfaces
- 2 optical/electrical Ethernet
- 1 electrical Ethernet for local access with DHCP server built in
- 2 CAN

Centralized control unit
Terminal blocks and cable arrangement
Power Insulation Transformer

For trackside signalling

- 40 kVA power
- According to ST IS 365 ed. 2008
- CEI EN 60064-1
- Pulse test 8kV
48 VDC Power Station

For railway high speed lines TLC devices

- **VIN:** 230 VAC, 50 Hz
- **VOUT** 2 x 48Vdc @60A
- **Dimensions** 800 x 600 x 2000 mm
- **Battery** 200 Ah
- **Main features** Redundancy n+1, Hot swap, Natural convection
110/132 VDC Rectifier + Battery Charger

for 3kVDC EESs and TE Cabins Auxiliary Services

- VIN: 400 VAC – 50 Hz, 3-ph +N
- VOUT: 110/132 VDC @ 50 A (100 A 1’)
- Size: 800 x 600 x 2200 mm
- Natural Convection
- Double branch -Redundancy
- Battery status monitoring
- RS232, RS485
- Ethernet, Optical fiber
110/48 VDC Rectifier + Battery Charger & Distribution switch

for tram EESs

- **VIN:** 400 VAC - 50 Hz, 3-ph +N
- **VOUT:** 110 VDC @ 50A
  - 48VDC@10A aux
- **Battery:** 90 VDC 45 cells 145 Ah
- **Main features:** IGBT technology
  - Battery efficiency monitoring
Rectifier + Battery Charger

for 3kVDC EESs and TE Cabins Auxiliary Services

- **VIN:** 380 VAC - 50 Hz, 3-ph+N
- **VOUT:** 132 VDC @ double branch 50A+50A
- **Dimensions:** 600x600x2000 mm

Double branch
Chopper conversion
Battery efficiency monitoring
Meets TE54 + addendum
**ERTMS AC/DC PSU**

**AC/DC Line Encoder Unit Signalling PSU**

- **Input:** 88 ÷ 264 VAC 16 ÷ 440 Hz / 70 ÷ 380 VDC
- **Output:** +3,3 / ±12 / ±5 / 24 VDC Insulated
- **Power:** 45 W
- **Operating Temperature:** -30°÷ +85°C no derating

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A Line Side Electronic Unit (LEU) captures movement authority information from interlocking or signal aspect and selects and sends telegrams to Eurobalise® that contain movement authorities and trackside data.
Safety Ferro-resonant Power Supply

high speed line

- Input: 220 VAC 50Hz or 110 VAC 60 Hz
- Output: 48 VDC
- Power: 360 W
- Overload: +33% 48H; +100% 1h
- Parallelable: up to 10 units
600W AC/DC PSU
for SCMT lineside encoder

- Input: 120 ÷ 264 VAC, 47 ÷ 83 Hz
- Output: 15 / 48 / 48 Isolated VDC
- Power: 600 W
- Operating temperature: -30°÷ +85° C no derating

Over 12,000 km SCMT in Italy
Redundant 400 Hz Light Signals Inverter

- Input: 24 VDC
- Output: 2x125 VAC 400Hz
- Power: 120 VA
- Main features:
  - Dual redundant converters
  - Supervisory unit
  - Automatic switch
Track Circuit
Ferro Resonant Stabilised PSU

- Application: Track circuit power supply
- Input: 150 VAC
- Output: 12 – 24 – 48 VDC
- Power: Up to 240 W
Stand-alone trackside energy source

Energy from transient currents on track circuit

- Trackside monitoring, remote faults detection devices
- Input range $\pm 30 \div 200V$
- VOUT + 3 / ±15V DC
- Power 10 W (continuous 3h)
- Supercapacitors bank inside
Voltage Limiter Device
for earth protection circuits DC Lines

Standard
EN 50122-1
EN 50122-2

Intervention threshold
150V -20% +10%

Main features
RFI approved
Back up trigger circuit
Easy failure inspection
Pole/wall installation
Presettable trigger levels option
Thank you for your attention

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